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SEQUENCE LISTING

<110> Brookhaven Science Associates
Shanklin, John
Whittle, Edward J.

<120> Mutant Fatty Acid Desaturase and Methods for Directed Mutagenesis

<130> CIP of 10/017,145 filed December 14, 2001 which was a CIP of
09/328,550 filed on June 9, 1999, which was a CIP of 09/233,856
filed on January 19, 1999

<140> 10/822,370
<141> 2004-04-12

<150> 09/328,550
<151> 1999-06-09

<150> 10/017,145
<151> 2001-12-14

<150> 09/233,856
<151> 1999-01-19

<160> 19

<170> PatentIn version 3.2

<210> 1
<211> 363
<212> PRT
<213> Ricinus communis

<220>
<221> misc_feature
<223> ricinus communis delta 9 18:0 Acyl ACP Desaturase

<400> 1

Ala Ser Thr Leu Lys Ser Gly Ser Lys Glu Val Glu Asn Leu Lys Lys
1 5 10 15

Pro Phe Met Pro Pro Arg Glu Val His Val Gln Val Thr His Ser Met
20 25 30

Pro Pro Gln Lys Ile Glu Ile Phe Lys Ser Leu Asp Asn Trp Ala Glu
35 40 45

Glu Asn Ile Leu Val His Leu Lys Pro Val Glu Lys Cys Trp Gln Pro
50 55 60

Gln Asp Phe Leu Pro Asp Pro Ala Ser Asp Gly Phe Asp Glu Gln Val
65 70 75 80

Arg Glu Leu Arg Glu Arg Ala Lys Glu Ile Pro Asp Asp Tyr Phe Val
85 90 95

Val Leu Val Gly Asp Met Ile Thr Glu Glu Ala Leu Pro Thr Tyr Gln
100 105 110

Thr Met Leu Asn Thr Leu Asp Gly Val Arg Asp Glu Thr Gly Ala Ser
115 120 125

Pro Thr Ser Trp Ala Ile Trp Thr Arg Ala Trp Thr Ala Glu Glu Asn
130 135 140

Arg His Gly Asp Leu Leu Asn Lys Tyr Leu Tyr Leu Ser Gly Arg Val
145 150 155 160

Asp Met Arg Gln Ile Glu Lys Thr Ile Gln Tyr Leu Ile Gly Ser Gly
165 170 175

Met Asp Pro Arg Thr Glu Asn Ser Pro Tyr Leu Gly Phe Ile Tyr Thr
180 185 190

Ser Phe Gln Glu Arg Ala Thr Phe Ile Ser His Gly Asn Thr Ala Arg
195 200 205

Gln Ala Lys Glu His Gly Asp Ile Lys Leu Ala Gln Ile Cys Gly Thr
210 215 220

Ile Ala Ala Asp Glu Lys Arg His Glu Thr Ala Tyr Thr Lys Ile Val
225 230 235 240

Glu Lys Leu Phe Glu Ile Asp Pro Asp Gly Thr Val Leu Ala Phe Ala
245 250 255

Asp Met Met Arg Lys Lys Ile Ser Met Pro Ala His Leu Met Tyr Asp
260 265 270

Gly Arg Asp Asp Asn Leu Phe Asp His Phe Ser Ala Val Ala Gln Arg
275 280 285

Leu Gly Val Tyr Thr Ala Lys Asp Tyr Ala Asp Ile Leu Glu Phe Leu
 290 295 300

Val Gly Arg Trp Lys Val Asp Lys Leu Thr Gly Leu Ser Ala Glu Gly
 305 310 315 320

Gln Lys Ala Gln Asp Tyr Val Cys Arg Leu Pro Pro Arg Ile Arg Arg
 325 330 335

Leu Glu Glu Arg Ala Gln Gly Arg Ala Lys Glu Ala Pro Thr Met Pro
 340 345 350

Phe Ser Trp Ile Phe Asp Arg Gln Val Lys Leu
 355 360

<210> 2
 <211> 1092
 <212> DNA
 <213> Ricinus communis

<220>
 <221> misc_feature
 <223> residues 138 to 1239 of open reading frame

<400> 2
 gcctctaccc tcaagtctgg ttctaaggaa gttgagaatc tcaagaagcc tttcatgcct 60
 cctcgggagg tacatgttca ggttacccat tctatgccac cccaaaagat tgagatcttt 120
 aaatccctag acaattgggc tgaggagaac attctgggtc atctgaagcc agttgagaaa 180
 tgttggcaac cgcaggattt ttgcccagat cccgcctctg atggatttga tgagcaagtc 240
 agggaaactca gggagagagc aaaggagatt cctgatgatt attttgttgt ttgggttgga 300
 gacatgataa cggaagaagc ctttcccact tatcaaaca tgctgaatac cttggatgga 360
 gttcgggatg aaacaggtgc aagtcctact tcttgggcaa tttggacaag ggcattggact 420
 gcggaagaga atagacatgg tgacctctc aataagtatc tctacctatc tggacgagtg 480
 gacatgaggc aaattgagaa gacaattcaa tatttgattg gttcaggaat ggatccacgg 540
 acagaaaaca gtccatacct tgggttcac tatacatcat tccaggaaag ggcaaccttc 600
 atttctcatg ggaacactgc ccgacaagcc aaagagcatg gagacataaa gttggctcaa 660
 atatgtggta caattgctgc agatgagaag cgccatgaga cagcctacac aaagatagtg 720
 gaaaaactct ttgagattga tcctgatgga actgttttgg cttttgctga tatgatgaga 780

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aagaaaattt ctatgcctgc acacttgatg tatgatggcc gagatgataa tcttttttgac      840
cactttttcag ctgttgcgca gcgtcttggg gtctacacag caaaggatta tgcagatata      900
ttggagttct tgggtgggcag atggaagggtg gataaactaa cgggcctttc agctgagggg      960
caaaaggctc aggactatgt ttgtcgggta cctccaagaa ttagaaggct ggaagagaga     1020
gctcaaggaa gggcaaagga agcaccacc atgcctttca gctggatttt cgataggcaa     1080
gtgaagctgt ag                                                           1092

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```

<210> 3
<211> 34
<212> DNA
<213> Artificial

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<220>
<223> amplification primer

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```

<220>
<221> misc_feature
<223> PCR primer; sequence flanking unique XbaI site at the 5' end of
      the open reading frame

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```

<400> 3
gtgagcggat aacaatttca cacagtctag aaat                                     34

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```

<210> 4
<211> 72
<212> DNA
<213> Artificial

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<220>
<223> amplification primer

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<220>
<221> misc_feature
<222> (56)..(57)
<223> PCR primer is a degenerate oligonucleotide in which "n" indicates
      the presence of either C, A, T or G at that nucleotide position

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```

<400> 4
ccaaattgcc caagacgtcg gacttgcacc tgtttcatcc cgaactccat ccaamnnatt      60
cagcattggt tg                                                           72

```

```

<210> 5
<211> 31
<212> DNA
<213> Artificial

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<220>
 <223> amplification primer

<220>
 <221> misc_feature
 <223> PCR primer

<400> 5
 gaaacagggtg caagtccgac gtcttgggca a

31

<210> 6
 <211> 26
 <212> DNA
 <213> Artificial

<220>
 <223> amplification primer

<220>
 <221> misc_feature
 <223> PCR primer

<400> 6
 gttttctgtc cgcggatcca ttcctg

26

<210> 7
 <211> 34
 <212> DNA
 <213> Artificial

<220>
 <223> amplification primer

<220>
 <221> misc_feature
 <223> PCR primer

<400> 7
 gtgagcggat aacaatttca cacagtctag aaat

34

<210> 8
 <211> 30
 <212> DNA
 <213> Artificial

<220>
 <223> amplification primer

<220>
 <221> misc_feature

<223> PCR primer

<400> 8

cacgaggccc tttcgtcttc aagaattctc

30

<210> 9

<211> 28

<212> DNA

<213> Artificial

<220>

<223> amplification primer

<220>

<221> misc_feature

<223> PCR primer

<400> 9

ttgataagtg ggaagggctt cttccgtt

28

<210> 10

<211> 66

<212> DNA

<213> Artificial

<220>

<223> amplification primer

<220>

<221> misc_feature

<222> (32)..(34)

<223> PCR primer is degenerate oligonucleotide in which "n" indicates the presence of either C, A, T, or G at that nucleotide position and in which "k" indicates either T or G

<220>

<221> misc_feature

<222> (41)..(43)

<223> PCR primer is a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G and in which "k" indicates the presence of either T or G.

<220>

<221> misc_feature

<222> (44)..(46)

<223> PCR primer is a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T, or G at that nucleotide position and in which "k" indicates the presence of either T or G.

<400> 10

aacggaagaa gcccttccca cttatcaaac annkctgaat nnknnkgatg gagttcggga

60

tgaaac

66

<210> 11
 <211> 26
 <212> DNA
 <213> Artificial

<220>
 <223> amplification primer

<220>
 <221> misc_feature
 <223> PCR primer

<400> 11
 tccattcctg aaccaatcaa atattg

26

<210> 12
 <211> 70
 <212> DNA
 <213> Artificial

<220>
 <223> amplification primer

<220>
 <221> misc_feature
 <222> (22)..(24)
 <223> PCR primer in a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position and in which "k" indicates the presence of either T or G at that nucleotide position.

<220>
 <221> misc_feature
 <222> (28)..(30)
 <223> PCR primer in a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position and in which "k" indicates the presence of either T or G at that nucleotide position.

<220>
 <221> misc_feature
 <222> (49)..(51)
 <223> PCR primer in a degenerate oligonucleotide in which "n" indicates the presence of either C, A, T or G at that nucleotide position and in which "k" indicates the presence of either T or G at that nucleotide position.

<400> 12
 ttgattgggt caggaatgga tnnkcggnk gaaaacagtc cataccttnn kttcatctat

60

acatcattcc

70

<210> 13
 <211> 30
 <212> DNA
 <213> Artificial

<220>
 <223> amplification primer

<220>
 <221> misc_feature
 <223> PCR primer

<400> 13
 gcaaaagcca aaacggtacc atcaggatca

30

<210> 14
 <211> 59
 <212> DNA
 <213> artificial

<220>
 <223> amplification primer

<400> 14
 ccaaaaagaaa aaggtaagaa aaccgaggat ggctctcaag ctcaatcctt tcctttctc

59

<210> 15
 <211> 31
 <212> DNA
 <213> artificial

<220>
 <223> amplification primer

<400> 15
 ttgctctctc cctgagttcc ctgacttgct c

31

<210> 16
 <211> 31
 <212> DNA
 <213> artificial

<220>
 <223> amplification primer

<400> 16
 gagcaagtca gggaactcag ggagagagca a

31

<210> 17
 <211> 38
 <212> DNA

<213> artificial

<220>

<223> amplification primer

<400> 17

tcctttgacc ttccttgggc tctctcttcc agccttct

38

<210> 18

<211> 37

<212> DNA

<213> artificial

<220>

<223> amplification primer

<400> 18

gaaggctgga agagagagcc caaggaaggg caaagga

37

<210> 19

<211> 42

<212> DNA

<213> artificial

<220>

<223> amplification primer

<400> 19

tgaattcgat atcgagctct acagcttcac ttgcctatcg aa

42